

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Toshiyuki INAGAKI

Attn: PCT Branch

Application No. New U.S. National Stage of PCT/IB2004/004237

Filed: June 12, 2006

Docket No.: 128357

For: FUEL CELL STACK STRUCTURE

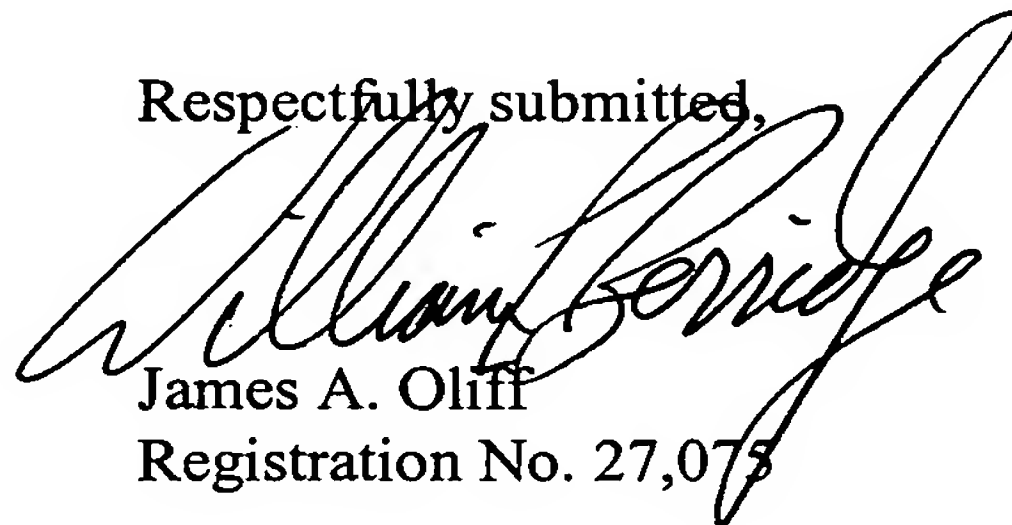
**SUBMISSION OF THE ANNEXES TO THE
INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Attached hereto is a copy of the annexes to the International Preliminary
Report on Patentability (Form PCT/IPEA/409). The attached material replaces the claims.

Respectfully submitted,



James A. Oliff
Registration No. 27,073

William P. Berridge
Registration No. 30,024

JAO:WPB/emt

Date: June 12, 2006

OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

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AP20 Rec'd PCT/PTO 12 JUN 2006

Enclosure of February 6, 2006

PCT Patent Application No.: PCT/IB2004/004237

Applicant: TOYOTA JIDOSHA KABUSHIKI KAISHA

Title: "Fuel Cell Stack Structure"

Our ref.: WO 43080

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New claims

10 1. A structure of a fuel cell stack comprising:
a plurality of cells (19) each formed by interposing
an MEA including an electrolyte membrane (11), an electrode
(14, 17), a catalyst layer and a diffusion layer (13, 16)
between two separators (18), each of the cells (19) having
15 a power generation region (35) in which power is generated
and a non-power generation region (36) in which power is
not generated, and

an adhesive layer (33) is provided between the
separators (18) in at least one of the cells (19), wherein
20 the non-power generation region (36) includes at least
one of:

(i) a region where the electrolyte membrane (11) is
located between the separators (18), and a portion of the
adhesive layer (33) is provided between the electrolyte
25 membrane (11) and one of the separators (18), and

(ii) another region where the electrolyte membrane
(11) is not located and another portion of the adhesive
layer (33) is provided between the separators (18),
characterized in that

30 said portion of the adhesive layer (33) between the
electrolyte membrane (11) and one of the separators (18) is
provided between the electrode (14, 17) and one of the
separators (18).

35 2. The structure of the fuel cell stack according to
claim 1, characterized in that the adjacent cells (19)
sandwich another adhesive layer (33).

3. The fuel cell stack structure according to claim 1 or 2, characterized in that the adhesive layer (33) has a Young's modulus of at most 100 MPa.

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4. The fuel cell stack structure according to claim 3, characterized in that the Young's modulus of the adhesive layer (33) is within a range of 50 MPa to 30 MPa.

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5. The fuel cell stack structure according to claim 1 or 2, characterized in that the adhesive layer (33) has a thickness of 50 μm to 150 μm .

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6. The structure of the fuel cell stack according to claim 1 or 2, characterized in that a rigid spacer (34) is provided in the adhesive layer (33).

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7. The structure of the fuel cell stack according to claim 6, characterized in that the rigid spacer (34) is provided in the adhesive layer (33) throughout the non-power generation region (36).

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8. The fuel cell stack structure according to claim 6 or 7, characterized in that the adhesive layer (33) has a thickness that allows the adhesive layer (33) to have a Young's modulus of at most 100 MPa even if the hard spacer is provided in the adhesive layer (33).

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9. The fuel cell stack structure according to claim 1, characterized in that a plurality of multi-cell modules (40) each formed by stacking a plurality of said cells (19) are linearly arranged in a cell stacking direction, and that a bead gasket is provided as a seal between the multi-cell modules (40), and that a separator (18) of an end cell of a multi-cell module (40) which contacts the

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bead gasket has a greater planar rigidity than a separator (18) of a central cell of the multi-cell module (40).

10. The fuel cell stack structure according to claim 5 9, characterized in that the planar rigidity of the separator (18) of the end cell of the multi-cell module (40) is made greater than the planar rigidity of the separator (18) of the central cell by placing a generally flat plate on the separator (18) of the end cell.

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11. The fuel cell stack structure according to claim 1, characterized in that only the adhesive layer (33) is provided between the two separators (18).

15 12. The structure of the fuel cell stack according to claim 1, characterized in that the adhesive layer (33) is provided between the separators (18) in the entire non-power generation region (36).

20 13. The structure of the fuel cell stack according to claim 1, characterized in that the adhesive layer (33) contains rigid beads each of which has a diameter equal to or smaller than a thickness of the adhesive layer (33).

25 14. The structure of the fuel cell stack according to claim 1, characterized in that the separators (18) are metal separators.